

## Soil total/ organic / inorganic phosphorus content Assay Kit

**Note:** It is necessary to predict 2-3 large difference samples before the formal determination

**Operation Equipment:** Spectrophotometer

**Cat No:** AK0171

**Size:** 50T/48S

### Components:

Reagent I: Liquid 50 mL×1, store at 4°C . Dilute 10 times with distilled water before use.

Reagent II: Liquid 11 mL×1, store at 4°C .

Reagent III: Powder×1, store at 4°C . Add 20 mL of distilled water and 10 mL of Reagent II before use and mix thoroughly.

Standard: Liquid 1 mL×1, 40 µg/mL inorganic phosphorus standard solution, store at 4°C .

### Product Description:

Soil phosphorus includes organic and inorganic phosphorus. the inorganic phosphorous can directly used by plants. Soil organic phosphorus is mineralized and decomposed into inorganic phosphorus. Determine the total phosphorus, organic phosphorus and inorganic phosphorus in the same time can fully reflect the condition of soil phosphorus nutrition.

Molybdenum blue is used to determine phosphorus. One sample of soil is taken and the content of inorganic phosphorus is determined by extraction method. The content of total phosphorus was measured by taking another sample after burning at high temperature. The content of organic phosphorus is calculated by subtracting the content of inorganic phosphorus from the total phosphorus content.

### Required reagents and equipments:

Spectrophotometer, centrifuge, water bath, scale, transferpettor, 550°C high temperature electric stove, 1mL glass cuvette, distilled water and 100 meshes sieve (or smaller).

### Procedure:

#### I . Sample preparation:

1. Inorganic phosphorus: Take 0. 1g fresh soil sample after 100 meshes sieve to the 10mL centrifuge tube, add 10mL Reagent I, mix thoroughly, incubate at 45°C water bath for 1 h, centrifuge at 8000 rpm and 25°C for 10min, supernatant I is ready to test the content of inorganic phosphorus.
2. Total Phosphorus: Take fresh soil sample after 100 meshes sieve, burn at 550°C for 1h. Take 0. 1g sample to the 10mL centrifuge tube after cooling, add 10mL Reagent I, mix thoroughly, incubate at 45°C water bath for 1 h and then centrifuge at 8000 rpm and 25°C for 10min, take supernatant II to test the content of total phosphorus.

#### II . Determination

1. Preheat spectrophotometer for 30 min, adjust wavelength to 660 nm, set zero with distilled water.
2. Adjust the temperature of water bath to 40°C .
3. Blank tube: Add 500µL of distilled water and 500µL of Reagent III to a centrifuge tube and incubate at 40°C water bath for 10min after mix thoroughly. Detect the absorbance of 660 nm after cooling, record  $A_B$  .
4. Standard tube: Add 50µL of standard, 450µL of distilled water and 500µL of Reagent III to a centrifuge

tube, incubate at 40°C water bath for 10min after mix thoroughly. Detect the absorbance of 660 nm after cooling, record  $A_S$ .

5. Test tube: Add 50 $\mu$ L of supernatant I or supernatant II, 450 $\mu$ L of distilled water and 500 $\mu$ L of Reagent III to centrifuge tube, incubate at 40°C water bath for 10min after mix thoroughly. Detect the absorbance of 660 nm after cooling, record  $A_T$ .

### III. Calculation

1. Soil inorganic phosphorus ( $\mu$ g/g)=[ $C_S \times (A_T - A_B) \div (A_S - A_B)$ ] $\times V_T \div W = 400 \times (A_T - A_B) \div (A_S - A_B) \div W$

$C_S$ : 40  $\mu$ g/mL;

W: Soil sample weight , g;

$V_T$ : Total volume of supernatant , 10 mL.

2. Soil total phosphorus ( $\mu$ g/g)=[ $C_S \times (A_T - A_B) \div (A_S - A_B)$ ] $\times V_T \div W = 400 \times (A_T - A_B) \div (A_S - A_B) \div W$

$C_S$ : 40  $\mu$ g/mL;

$V_S$ : 50 $\mu$ L=0.05 mL;

W: Soil sample weight , g;

$V_T$ : Total volume of supernatant , 10 mL.

3. Soil organic phosphorus( $\mu$ mol/g)=Soil total phosphorous- Soil inorganic phosphorous.

### Note:

1.Reagent III needs to be prepared in advance for day use only. It exists possibly black solid when preparing which won't affect the outcome. Do not inhale the black solid in the course of experiment.

2. If the absorbance value is greater than 1, the sample should be diluted with distilled water.

3. The blank tube and standard tube only need to be measured 1-2 times

4. The colorimetry should be completed within 40 minutes.

### Related Products:

AK0372/AK0371 Soil Phosphate(S-PHOS) Content Assay Kit

AK0173/AK0172 Soil Hydrargyrum(S-Hg) Content Assay Kit

AK0165/AK0164 Soil Available sulfur Content Assay Kit

### Technical Specifications:

The detection limit: 0.5429  $\mu$ g/mL

Linear range: 2-80  $\mu$ g/mL